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NOTES AND LITERATURE.

ZOÖLOGY.

Beddard's "Mammalia." [1] — Through the publication of this excellent manual of the class Mammalia Mr. Beddard has placed the general student under lasting obligations. The subject could hardly be more judiciously treated in the limited space of a single convenient volume of six hundred pages. In scope and general character it occupies nearly the same field as Flower and Lydekker's *An Introduction to the Study of Mammals, Living and Extinct*, published in 1891, and now necessarily in some respects a little out of date. The two works are, however, naturally constructed on practically the same plan.

The "Scheme of Classification" (pp. ix–xii) recognizes only two subclasses, the Prototheria (Allotheria, Marsh; Multituberculata, Cope), including the echidnas and the duckbill, and the Eutheria, comprising all the other members of the class. These latter are divided among the following thirteen orders:

Marsupialia,
Edentata,
Ganodonta,
Ungulata,
Sirenia,
Cetacea,
Carnivora,
Creodonta,
Rodentia,
Tillodontia,
Insectivora,
Chiroptera,
Primates.

The orders are further subdivided into 28 suborders (of which six are extinct) and 109 families. The number of species is stated to be 3000, but this is obviously far too low an estimate, even for the existing species. Trouessart, in his *Catalogus Mammalium* (1897, 1898), listed upward of 7300, and hundreds have since been added. Doubtless 8000 to 10,000 species would not be too high an estimate for both fossil and recent.

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[1] Beddard, F. E. *Mammalia*. The Cambridge Natural History, vol. x. London, Macmillan, 1902. 8vo, xii + 605 pp., 285 figs.

In the brief introduction (pp. 1–4) the class Mammalia is very satisfactorily defined; and in reference to their position as the "highest of the Vertebrates," the term "highest," in comparison with "specialization," is considered, and its use in such a connection is amply defended, since "specialization" does not necessarily imply the perfection and complexity of structure that is involved in the term "highest." "Most specialized" and "highest," and "least specialized" and "lowest" are therefore not the equivalent alternatives some writers have considered them to be, and in preferring the former to the latter as more definite and exact expressions they have not thereby secured greater accuracy of statement.

An exposition of the structure of mammals occupies pages 5–78, and deals concisely with their external form, skeleton, skull, teeth, the organs of digestion, respiration, reproduction, the brain, etc., with numerous well-chosen illustrations. The present distribution of the class and the subject of zoölogical regions is treated less satisfactorily (pp. 78–89): because the tiger "is as much at home in a tropical jungle as on the icy plains of northern Asia" is no proof that "the world cannot be mapped out into areas bounded by parallels of temperature"; because there are a few wide-ranging types it does not follow that temperature does not constitute one of the most powerful controlling influences in the distribution of life over the globe. The primary regions and their subdivisions here adopted are, however, those now most generally accepted.

Chapter III (pp. 90–95) considers "The Possible Forerunners of the Mammalia," and Chapter IV (pp. 96–104) is entitled "The Dawn of Mammalian Life"; both subjects are carefully and conservatively treated. The rest of the volume takes up the orders of mammals in their systematic sequence, from monotremes to primates. Respecting this part of the work the author says: "I have given, I hope, adequate treatment from the standpoint of a necessarily limited treatise to the majority of the more important genera of mammals both living and extinct." Such groups as the Edentata and Marsupialia are given relatively, and very appropriately, much more space than is accorded to many of the other orders. On the other hand, the Rodentia and Chiroptera, with their multitude of forms, are treated so briefly that one almost regrets that the plan of the work did not permit of an additional hundred pages or so, in order to more fully notice these and a few other groups now very briefly noticed or quite omitted. But the author has given us so much that is good in this excellent manual that it is rather ungracious to make such omissions, doubtless seemingly necessary from the publishers' standpoint, a matter of criticism.

Notwithstanding the general excellence of Mr. Beddard's *Mammalia*, there are a few slips and misstatements that should hardly pass without notice. While generally free from typographical errors, the reference on p. 415 to "Wortman and Malkens" might puzzle readers unprepared to recognize that "Malkens" is a misprint for Matthew. As a general criticism, it may be stated that the author is averse to the adoption of most of the recent changes in nomenclature, due to the enforcement of the foundation principle of nomenclature, the rule of priority. A few of them — and among them some of the most unwelcome — have been adopted, but in most instances the author is content to say, as in the notorious case of Trichechus for the walruses: "This family contains but one genus, *Trichechus*, . . . or *Odobœnus*, as the more correct term seems to be." And so on in many other instances, temporary convenience, at the cost of a vitiated nomenclature, being preferred to the slight inconvenience of introducing to the general public, and particularly to the rising generation of students, names recently established as the correct names, and which will therefore, sooner or later, become the familiar names in the literature of the subject. The conservatism of habit is thus allowed to retard progress in the attainment of a correct and stable nomenclature. Incidentally it may be added that the author recognizes only one species of walrus instead of two; which is only to be explained on the ground of inertia or conservatism, and lack of actual investigation of the point in question; for although Mr. Beddard is almost ultra-conservative in the matter of species and genera, it is hardly possible to believe that he could say, "There is but one species of walrus, though it has been attempted to show that the Pacific and Eastern forms are different," if he had actually compared the skulls of the two forms.

In his comment on the elephants he notes that (p. 221) the African elephant "has been sometimes referred to a distinct genus or subgenus, Loxodon," and later (p. 223) speaks of the Indian elephant as "*Euelephas indicus*, if the genus Loxodon is to be accepted"; whereas in reality the Indian elephant would in such case retain the name *Elephas indicus*, *Euelephas* being a synonym of *Elephas*. Judging from his treatment of the rhinoceroses (to pass over many other similar cases), the author's conception of genera is open to revision, since such groups (as well as the higher groups) are supposed to indicate degree of differentiation regardless of whether they consist of a single species or many; and not that diverse types are to be thrown together, if they happen to have some striking features in common and are each represented by single species.

The enumeration of Reithrodontomys as a characteristic South American genus (p. 480) is probably an inadvertence, as is perhaps the statement that Capromys "is found only in the islands of Cuba and Jamaica," whereas there is a species in the Bahamas, another on Swan Island, coast of Honduras, and still another in Venezuela. It is, however, surprising to find currency again given, especially in a work of high scientific standing, to the long since exploded myth of the "happy-family" relations of the prairie dog, owl, and rattlesnake. It is also rather surprising to find the statement (p. 518) that the common mole of the eastern United States (*Scalops aquaticus*) is "a creature of largely aquatic habits,"—a wholly false inference, derived apparently from the animal's unfortunate specific name. It is also not quite true that the arctic fox (*Canis lagopus*) "is known by its bluish summer coat and pure white winter dress as 'blue fox' and 'white fox' respectively." This has been so often stated in books of natural history that Mr. Beddard cannot be blamed for repeating it; but the truth is that the blue and white phases are not altogether seasonal conditions, since at some localities, as the Aleutian and Pribilof Islands, only blue foxes are found. Indeed the blue foxes of these islands are regarded by the latest authorities on the group as specifically distinct from the white fox.

The foregoing criticisms relate for the most part to minor matters, which do not seriously detract from the value of the work. As would be expected, Mr. Beddard's treatment of his subject is thorough, and fairly represents the latest generally accepted views and results in systematic mammalogy, a field in which he has long been an energetic worker and a recognized authority. The publishers have done well their part in placing before the public a needed work of great merit in pleasing form. The paper and typography are all that could be desired, and the illustrations, abundant and well-selected (those of structural characters are mainly after Flower, Wiederscheim, De Blainville, Osborn, and others), are printed with admirable clearness. Mr. Dixon's numerous full-length drawings are of unequal merit, but most of them are both satisfactorily artistic and effective, while some are admirable.

J. A. A.